

REMARKS

Claims 1-4, 9-13, and 15-24 are all the claims pending in the application. This Amendment amends claims 1, 9, 11, 16, and 17, adds claims 18-24, cancels claims 5 and 14, and addresses each point of objection and rejection raised by the Examiner. Favorable reconsideration is respectfully requested.

Applicant thanks the Examiner for acknowledging the claim for foreign priority under 35 U.S.C. § 119, and initialing the Information Disclosure Statement filed August 1, 2003.

The Examiner indicated that the priority document had not been received. As explained in the Letter Regarding Lost Priority Document filed January 30, 2004, review of the PTO file was requested, as the priority document was filed August 1, 2003. When Applicant's undersigned representative checked the image file wrapper via the USPTO PAIR system on March 1, 2004, the priority document was listed, such that the issue is believed resolved. Accordingly, **the Examiner is requested to confirm that the certified copy of the priority document was received in the next action.**

On page 2 of the Office Action, the Examiner indicated that the "application currently names joint inventors." To clarify the record, Applicant respectfully calls the Examiner's attention to the Declaration filed August 1, 2003, naming sole inventor Naoki Kubo.

As a preliminary matter, the Examiner objected to the title. A new title is included herein which is believed to be more descriptive. Consideration of the new title is requested.

Claims 1-17 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 6,208,023 to Nakayama *et al.* ("Nakayama").

As shown in Nakayama Figs. 9(a)-(c), it was known to mount a chip (101) on a grounded die pad (102), and provide a ground wire (106) connecting the chip (101) to the grounded die pad (102). However, heat radiation was inefficient, particularly because heat was conducted over a long distance from the chip (101) to the ground land (108) of substrate (109), the grounding land (108) also functioning as a radiator for radiating heat to the outside of the molding resin (107). *See col. 1, lines 57-65.*

To improve heat radiation to the grounding land, and improve mounting strength, Nakayama discloses a chip package in which the die pad (12) and lead terminals (14, 15) are “substantially flush” with the bottom of the chip package, as shown in Fig. 1(c), thereby improving thermal conductivity and conduction to the mounting substrate, and also reducing the mounting area. The bottom of the die pad (12) and the bottoms of the inner ends of the first lead terminals (14) come into contact with a grounding land (not shown) of a mounting substrate, such that the heat generated from the semiconductor chip 11 is directly conducted from the die pad 12 and the first leads 14 to the grounding land. *See col. 11, lines 2-8.* The adhesive used to mount the semiconductor device to the mounting substrate may be solder. *See col. 11, lines 20-24.* While the figures of Nakayama show only two terminals (15) per package, a greater number can be used. *See col. 10, lines 31-35.*

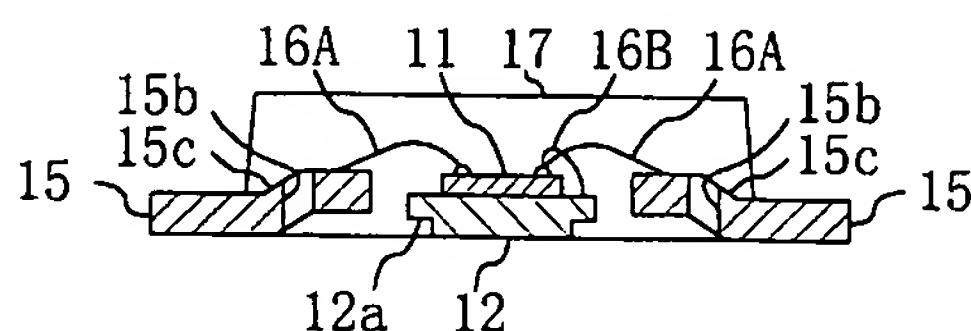
Regarding the independent claims, the Examiner cited chip (11) of Nakayama as the claimed IC chip, die pad (12) of Nakayama as the substrate, second lead (15) as the conductive layer, thickness reduced side portion 12(a) of the die pad (12) as the heat-radiating mechanism that is mounted on the substrate, and cites “16b” (*i.e.*, ground wire 16B) as electrically connecting the terminals of the IC chip and the heat-radiating mechanism.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *See* MPEP § 2131. The identical invention must be shown in as complete detail as is contained in the patent claim. *See* MPEP § 2131.

During examination, the claims are interpreted as broadly as their terms reasonably allow. *See* MPEP § 2111.01. This means that the words of the claim must be given their plain meaning unless a different definition is provided in the specification. *See* MPEP § 2111.01. The broadest reasonable interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach. *See* MPEP § 2111.

Applicant respectfully requests that the Examiner reconsider his interpretation, as the cited features of Nakayama do not support the rejections. For example, referring to claims 1 and 16, the Examiner cited second lead 15 of Nakayama and die pad 12 as being the substrate and the conductive layer, respectively. However, claim 1 requires a substrate including a conductive layer. Looking at Fig. (1) of Nakayama, it is clear that there is no such element as “a die pad 12 *including* a second lead 15.”

Fig. 1(b)



Similarly, referring to the “heat-radiating mechanism that is mounted on the substrate, disposed between the IC chip and the substrate...” and the Examiner’s construction of claims 1, 11, 16, and 17, Nakayama does not disclose a “thickness-reduced side portion 12a of the die pad

12 that is mounted on the die pad 12, *disposed between* the semiconductor chip 11 and the die pad 12.” This is also true of the step in claim 15 for “disposing a heat-radiating mechanism between the IC chip and the substrate.”

Further, referring to the requirement of claims 11 and 17 that the “terminals of the IC chip are electrically connected to the conductive layer via the heat-radiating mechanism” is also not taught. Consider “terminals of the semiconductor chip 11 are electrically connected to the second leads 15 via the thickness reduced side portions 12a of the die pad 12.” In Nakayama, connections are made *via* ground wires 16B to the die pad 12, and via wires 16A to the second leads 15, but there is no connection to the second leads 15 *via* the die pad 12.

Further, claim 15 recites “a substrate including a conductive layer sandwiched between insulating layers” and includes a step of “disposing through-holes in at least one of the insulating layers.” As explained above, die pad 12 does not *include* second leads 15. Further, claim 15 recites “disposing connection members ... so that the heat radiating mechanism and the conductive layer of the substrate are electrically connected...” Nakayama does not disclose “disposing connection members so that the thickness reduced side portions 12a and the second leads 15 of the die pad 12 are electrically connected.”

For at least these reasons, Applicant submits that independent claims 1, 11, 15, 16, and 17 are not anticipated. Reconsideration and withdrawal of the § 102 rejections are respectfully requested.

Additionally, Applicant has amended the claims as follows:

- Incorporating the subject matter of claim 5 into claims 1 and 16, canceling claim 5.

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- Rewriting claim 9 in independent form.
- Adding claims 18-21, which are similar to claims 2-5 but depend from claim 9.
- Incorporating the subject matter of claim 14 into claims 11 and 17, canceling claim 14.
- Adding claims 22 and 23 to depend from claim 10.
- Adding a new independent claim 24.

No new matter is added. These amendments are of an editorial nature, and are not in response to the Examiner's § 102 rejections. Entry and consideration of the amended claims are requested.

In view of the above, reconsideration of this application are now believed to be in order, and such actions is hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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